

# Dilution Determination for use with the RIPDES General Permit for Discharges Associated with the Treatment of Gasoline Contaminated Groundwater

1. Determine the point of discharge. The point of discharge is the location where the effluent first enters a surface water body.
2. Using a USGS map and the gauge station list given in the attached USGS table of 7Q10 Statistics for Rhode Island Stations, locate the gauge station that is closest to the point of discharge. The gauge station must be in the same watershed as the point of discharge. If there is not a gauge station located in the watershed, please refer to the list of approved methods for estimating flow found in Section IV of the instructions for the RIPDES Notice of Intent.

3. Find the drainage area of the watershed that is upstream of the gauge station. (Given in the attached table.)

$$DA_{\text{Upstream of Gauge}} = \underline{\hspace{2cm}}$$

4. Find the 7Q10 flow for the gauge station from the attached table.

$$7Q10 \text{ Gauge} = \underline{\hspace{2cm}}$$

5. Determine the drainage area of the watershed that is upstream from the point of discharge.

$$DA_{\text{Upstream of Discharge}} = \underline{\hspace{2cm}}$$

6. Calculate the equivalent 7Q10 flow using the following formula:

$$7Q10 \text{ EQ} = \frac{7Q10 \text{ Gauge}}{DA_{\text{Upstream of Gauge}}} \times DA_{\text{Upstream of Discharge}} = \underline{\hspace{2cm}}$$

7. Calculate the dilution factor using the following formula:

$$\text{Dilution Factor} = \frac{\{ (7Q10 \text{ EQ}) + (\text{System Design Flow}) \}}{\{ \text{System Design Flow} \}} = \underline{\hspace{2cm}}$$

**7Q10 STATISTICS FOR RHODE ISLAND GAGING STATIONS**  
(Statistics Based on Start of Period of Record Through Indicated Water Year)

| STATION<br>NUMBER<br>(Feet)              | STATION NAME & LOCATION                        | STARTING<br>WATER<br>YEAR | DRAINAGE<br>AREA<br>(Sq. Miles) | 7Q10<br>(Cubic Ft/Second) |
|--|--|---------------------------|---------------------------------|---------------------------|
| <b>ACTIVE STATIONS<sup>1</sup></b>       |  |                           |                                 |                           |
| 01109403                                 | Ten Mile River @ East Providence               | 1988                      | 53.1                            | 15.56                     |
| 01111300                                 | Nipmuc River Near Harrisville                  | 1965                      | 16.0                            | 0.37                      |
| 01111500                                 | Branch River @ Forestdale                      | 1941                      | 91.2                            | 13.69                     |
| 01112500                                 | Blackstone River @ Woonsocket*                 | 1930                      | 416                             | 102.25                    |
| 01114000                                 | Moshassuck River @ Providence**                | 1965                      | 23.1                            | 4.22                      |
| 01114500                                 | Woonasquatucket River @ Centerdale             | 1943                      | 38.3                            | 7.81                      |
| 01116000                                 | South Branch Pawtuxet River @ Wash-<br>ington* | 1942                      | 63.8                            | 17.08                     |
| 01116500                                 | Pawtuxet River @ Cranston*                     | 1941                      | 200                             | 70.90                     |
| 01117000                                 | Hunt River Near East Greenwich**               | 1942                      | 23.0                            | 1.23                      |
| 01117350                                 | Chipuxet River @ West Kingston**               | 1959,<br>1973             | 9.99                            | 2.82                      |
| 01117420                                 | Usquepaug River Near Usquepaug                 | 1959,<br>1975             | 36.1                            | 7.16                      |
| 01117468                                 | Beaver River Near Usquepaug                    | 1976                      | 8.87                            | 2.01                      |
| 01117500                                 | Pawcatuck River @ Wood River Junction          | 1942                      | 100                             | 28.48                     |
| 01117800                                 | Wood River Near Arcadia                        | 1965                      | 35.2                            | 7.24                      |
| 01118000                                 | Wood River @ Hope Valley                       | 1942                      | 72.4                            | 20.65                     |
| 01118500                                 | Pawcatuck River @ Westerly                     | 1942                      | 295                             | 69.59                     |
| <b>DISCONTINUED STATIONS<sup>2</sup></b> |  |                           |                                 |                           |
| 01106000                                 | Adamsville Brook @ Adamsville                  | 41-78                     | 8.01                            | 0.05                      |
| 01111400                                 | Chepachet River @ Chepachet                    | 66-72                     | 17.4                            | 2.23                      |
| 01112700                                 | Blackstone River Tributary @ Woonsocket        | 67-74                     | 2.22                            | NA                        |
| 01115100                                 | Mosquitohawk Brook Near North Scituate         | 67-74                     | 3.06                            | NA                        |
| 01115630                                 | Nooseneck River @ Nooseneck                    | 65-81                     | 8.23                            | 1.27                      |
| 01115770                                 | Carr River Near Nooseneck                      | 65-79                     | 6.73                            | 0.66                      |
| 01116300                                 | Furnace Hill Brook @ Cranston                  | 67-74                     | 4.19                            | NA                        |
| 01117600                                 | Meadow Brook Near Carolina                     | 67-74                     | 5.53                            | 0.11                      |
| 01126200                                 | Bucks Horn Brook @ Greene                      | 67-74                     | 5.52                            | 0.50                      |

<sup>1</sup>7Q10 based on data through Water Year 1993.

<sup>2</sup>7Q10 based on data through Water Year 1985.

\*Affected by stream flow regulation.

\*\*Affected by groundwater pumpage.

# = Station installed in 1987, statistics based on four (4) years of record.

**NA** = Not Available - Statistics will not compute if flow is zero (0) on any day. These streams go dry occasionally during periods of low flow.